3.6.1 Functional Configuration Audits (FCA)

This procedure describes the mandatory requirements and supplemental guidance for performing FCAs. It includes organizational roles and responsibilities.

3.6.1.1 Purpose

The procedure for performing an FCA is described below. The FCA is used to provide a systematic comparison of specification requirements with the results of tests, analyses, or inspections. It is accomplished as part of the process that verifies that a product's requirements have been met and that the product design meeting those requirements has been accurately documented before a product configuration is baselined.

3.6.1.2 Scope

This procedure applies to IPTs, regional offices, and other solution providers at the point when they begin activities to establish the product baseline.

3.6.1.3 Responsibilities

- IPTs, regional offices, and other solution providers are responsible for overall FCA coordination and guidance in the audit planning, conduct, recording, approval and follow-up activities. They ensure that configuration audits are included in the contractual requirements and allocate sufficient resources for this activity. If the audit is conducted at an FAA facility, the organization provides resources, clearances, and appropriate technical support for the audit.
- The Quality Assurance group assigns a Quality Reliability Officer (QRO) to the system acquisition. The QRO provides inspection and other quality records containing dates, times, and places of all inspections, demonstrations, and tests with an indication of whether the QRO witnessed these activities. The QRO also provides information of all known unique manufacturing processes, special tooling, and special test/inspection equipment. The QRO monitors the status of any uncovered deficiencies and deficiency corrections.
- For systems/subsystems that are installed and/or accepted at the Technical Center or a specified FAA site, local representatives provide technical expertise to the audit in terms of operation and installation.
- NAS Configuration Management and Evaluation Staff (ACM) reviews documentation, as requested by the IPT/PT, and may assist in the planning and conduct of the FCA. Depending on audit requirements, ACM may supply a representative to the audit team.
- The IPT, regional office or other solution provider develops an audit plan if none is contractually required. The plan is then coordinated with the contractor and audit team members for concurrence.

3.6.1.4 References

Reference	Reference Para./Activity #:
• FAA Order 1800.66, Appendix 1, *Configuration Management in the National Airspace System*, Part One – Configuration Management (CM) Policy Elements	• Statement I-4.5
• FAA Order 1800.66, Appendix 1, *Configuration Management in the National Airspace System*, Part Two – Configuration Management Handbook, Section II, National Configuration Management Process	• 8 Initiate Acquire and Build Activities • 18 Establish/Update Facility Baseline • 22 Conduct Functional Configuration Audit (FCA) • 45 Develop/Implement Corrective Action Plans • 101 Perform Configuration Status Accounting

3.6.1.5 Procedure

The FCA determines whether the actual performance of each configuration item complies with its controlling specifications. It verifies that the functional, design (if applicable) and proposed product baselines are consistent and that the system-level requirements are traceable as shown through the documentation and test results.

The IPT, region, or solution provider shall ensure that the contract requires an audit plan, either as a separate document or as a section of the contractor's configuration management plan. Table 3.6.1.5-1 provides a sample template for an audit plan. In developing the audit plan, the contractor may require input from the IPT/region/solution provider organization with respect to availability of representatives from the designated audit team organizations and (if the audit is to take place at an FAA facility) of facility resources. Scheduling audits depends on factors such as complexity and criticality of the system being audited, availability of input from product assurance disciplines, extent of the contractor's role according to contract requirements, availability of the requirements traceability matrix, and size and scope of documentation to be sampled.

The IPT/region/solution provider organization shall review the audit plan for feasibility and technical accuracy. If revisions are deemed necessary, the organization shall notify the contractor to revise the plan accordingly. Once the plan is approved, the organization shall ensure that all required audit team members are notified and available. These organizations typically include the Logistics Center and the Technical Center

The documentation will vary from system to system. It may include specifications, Interface Control Documents, manuals, drawings, test plans and procedures, test reports, the CM Plan and/or Audit Plan, the design review data package, provisioning or spare parts lists, requirements traceability matrix, and other contract deliverables.

Additional documentation originated by the IPT, region or solution provider may be required. These include Interface Requirements Documents, QRO test reports, contract modifications, Independent Validation and Verification (IV&V) reports, minutes from technical reviews, the CCD log, Program Technical Reports, Hardware Discrepancy Reports, and lists of outstanding changes. (NOTE: since the planning for the Physical Configuration Audit occurs at the same time as the planning for the Functional Configuration Audit, and since the planning for both audits are contained in the same document, these steps apply to the Physical Configuration Audit [Section 3.6.2] as well.)

The IPT/region/solution provider organization shall assemble the audit team, ensuring that selected members are available for the scheduled audit. The team members agree upon an audit agenda and the tasks to be performed.

Whether the audit is to take place at an FAA facility or a contractor facility, the organization shall ensure that the appropriate facility resources (including conference room space for the audit team) are available. Audits are generally held at contractor facilities; however, the requirements of a particular project may dictate that the audit is best held at an operational facility, the Technical Center, the Aeronautical Center, or a key site.

After the audit team and the facility have been prepared, the IPT/region/solution provider organization shall conduct the audit. The audit shall ensure the following criteria have been met:

- The controlling development specifications exist at the functional and as-built levels, and that the system-level specifications are baselined
- Each CI requirement can be traced to the system-level specifications
- The test results verify that each CI fulfills its functional, interface, and performance requirements.

The audit team shall examine outstanding variances against specific configuration items, reviews functional tests, and verifies requirements are traceable from the controlling system-level and allocated specifications to the specifications forming the product baseline. In some cases, the performance of parameters cannot be adequately tested; whenever that occurs, the audit team ensures that sufficient simulation and/or analysis is conducted to verify those parameters. The audit team also examines minutes from technical design reviews and other management reviews to determine that action items from those reviews have been dispositioned.

When the FCA is completed, the audit team shall prepare a report of the audit results. This report will indicate whether the audit is approved without conditions, approved with contingencies, or disapproved. The report shall catalog any uncovered deficiencies and provides conclusions and recommendations. The report shall also include FCA minutes, which are co-signed on a daily basis by the organization and the contractor.

If the audit is approved without conditions, the IPT/region/solution provider organization shall notify the contractor of the approval. If the audit is approved with contingencies, corrective actions will be performed. Corrective actions are generally tasked to the contractor, although in some cases the organization may undertake corrective actions as well. After corrective actions are completed, the QRO and other appointed representatives shall validate that the actions have been fulfilled. The organization shall then notify the contractor of certification.

Identification of major discrepancies such as unbaselined specifications, invalid or unverified requirements and uncorrected test failures shall require that the audit be disapproved. In such cases a recovery plan is necessary. The organization, in conjunction with the contractor, shall develop a recovery plan for correcting issues listed by the audit, using guidance from audit team members and experts from other disciplines as needed. The recovery plan shall include a schedule for conducting another audit after required testing has been completed. After the plan has been approved and steps to perform the recovery have been completed, the organization and the contractor begin this procedure again (without the planning steps, which have already been fulfilled) to perform the audit.

Procedural steps follow. Figure 3.6.1.5-1 is a graphical representation of these steps.

Procedure Step	Procedure Description
1. Develop Audit Plan	• The IPT/region/solution provider organization shall guide the development, modification and approval of the audit plan to include both FCA and PCA activities. The plan contains information such as scheduling, resources, the audit team, agenda, audit tasks, logistics, reporting, documentation to be used, and checklists. • The audit plan may be a separate document, or it may be a section of the Configuration Management Plan.

Procedure Step	Procedure Description
2. Review Audit Plan	• The IPT/region/solution provider organization shall review the audit plan for feasibility and technical accuracy.
3. Audit Plan Satisfactory?	• If the audit plan is not satisfactory, continue with Step 4. If the audit plan is satisfactory, proceed to Step 5.
4. Revise Audit Plan	• The IPT/region/solution provider shall ensure the audit plan is revised in accordance with organizational recommendations. Proceed to Step 2.
5. Schedule Audit	• The organization, in accordance with the audit plan and in conjunction with the contractor, shall schedule the audit. • Scheduling may be modified from that given originally in the audit plan depending on such factors as whether the testing at the CI level has been completed on time, whether the facilities are available, or whether the audit team members are available, etc.
6. Provide Audit Material	• The IPT/region/solution provider shall ensure contractor documentation required for the audit is available.
7. Assemble Audit Team	• The organization shall assemble the audit team to conduct the audit.
8. Audit at FAA Facility?	• If the audit is conducted at an FAA facility, continue with Step 9. Otherwise proceed to Step 10.
9. Prepare FAA Facility	• The organization shall ensure that appropriate resources for the audit are available, including conference room space for the audit team. Proceed to Step 11.
10. Prepare Contractor Facility	• The organization shall ensure the contractor provides appropriate resources for the audit, including conference room space for the audit team.
11. Conduct Audit	• The organization shall conduct the audit in accordance with the audit plan.

Procedure Step	Procedure Description
12. Record Audit Results	• The organization shall record results of the FCA. The report contains an approval/disapproval rating. • For an approval with contingencies, the report shall list corrective actions to be performed, a schedule to perform them, and a plan to validate them. • The report shall include a description of all required changes to established baselines in NAS-MD-001.
13. Audit Approved Without Conditions?	• If the audit is unconditionally approved, continue with Step 14. If the audit receives contingent approval or is disapproved, proceed to Step 15.
14. Provide Audit Certification	• The organization shall notify the contractor of FAA approval via certification.
15. Audit Approved?	• If the audit receives contingent approval, continue with Step 16. Otherwise proceed to Step 19.
16. Perform Correction Actions	• The organization shall ensure the contractor performs corrective actions to fix each uncovered deficiency.
17. Validate Corrective Actions	• The QRO and other representatives appointed by the organization shall determine whether corrective actions are satisfied.
18. Corrective Actions Fulfilled?	• If corrective actions were satisfactorily completed, continue with Step 14. Otherwise continue with Step 16.
19. Develop Recovery Strategy	• For disapproved audits, the organization, in conjunction with the contractor shall develop a recovery strategy. • The strategy shall include a schedule to fix deficiencies and a plan for a new audit. • After the recovery strategy is approved, the process for recovery may involve considerable effort. When the organization and the contractor reach concurrence that major deficiencies have been corrected, continue with Step 5.

Table 3.6.1.5-1. Sample Audit Plan Template: Typical Content

Audit Plan Section	Section Content
a. Cover Page	Includes the document title, effective date, and document control number.
b. Table of Contents	Lists title and page number of all titled sections and subsections, followed by titles and page numbers of all figures, tables, and appendices.
c. Section 1 – Introduction	Includes the following: • Purpose and scope of the plan • Brief description of the system to be audited • Description of the plan's major features and objectives.
d. Section 2 – Schedule and Personnel	Provides a schedule of audit activities, lists personnel (Government and contractor) participating in the audit, and describes the extent of personnel participation.
e. Section 3 – Configuration Items to be Audited	Lists the configuration items to be audited.
f. Section 4 – Audit Description	Describes the functional and physical audits to be performed. Includes audit tasks, logistics, documentation to be used, and checklists.
g. Section 5 – Audit Procedures	Provides procedures to be followed in the course of the audit.
h. Section 6 – Contractor Support	Describes the extent to which the contractor supports the audit. Includes personnel, equipment, facilities, etc.
i. Section 7 – Audit Reports	Contains the report summarizing audit results (developed following audit completion).

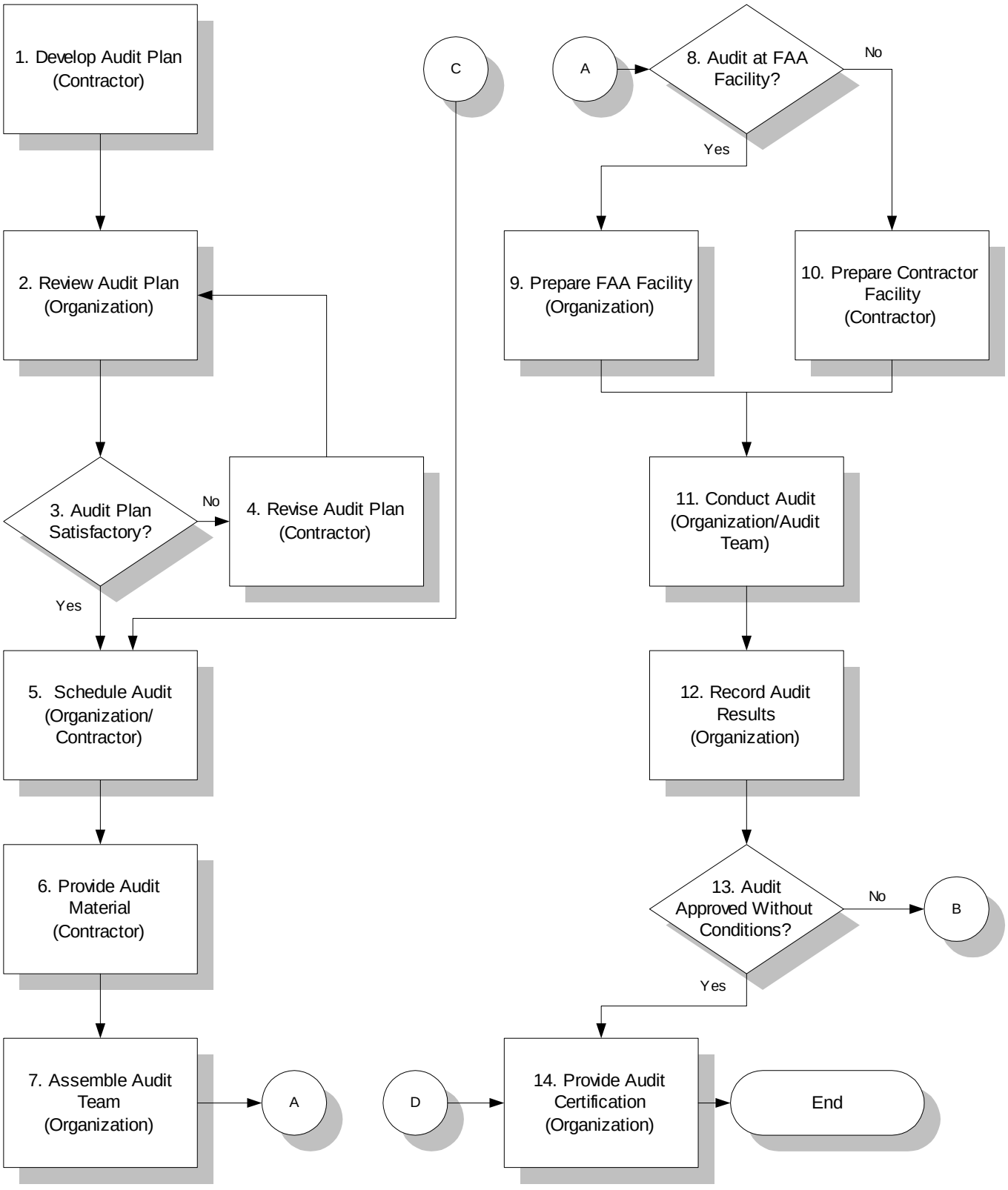

Figure 3.6.1.5-1. Functional Configuration Audits (Page 1 of 2)

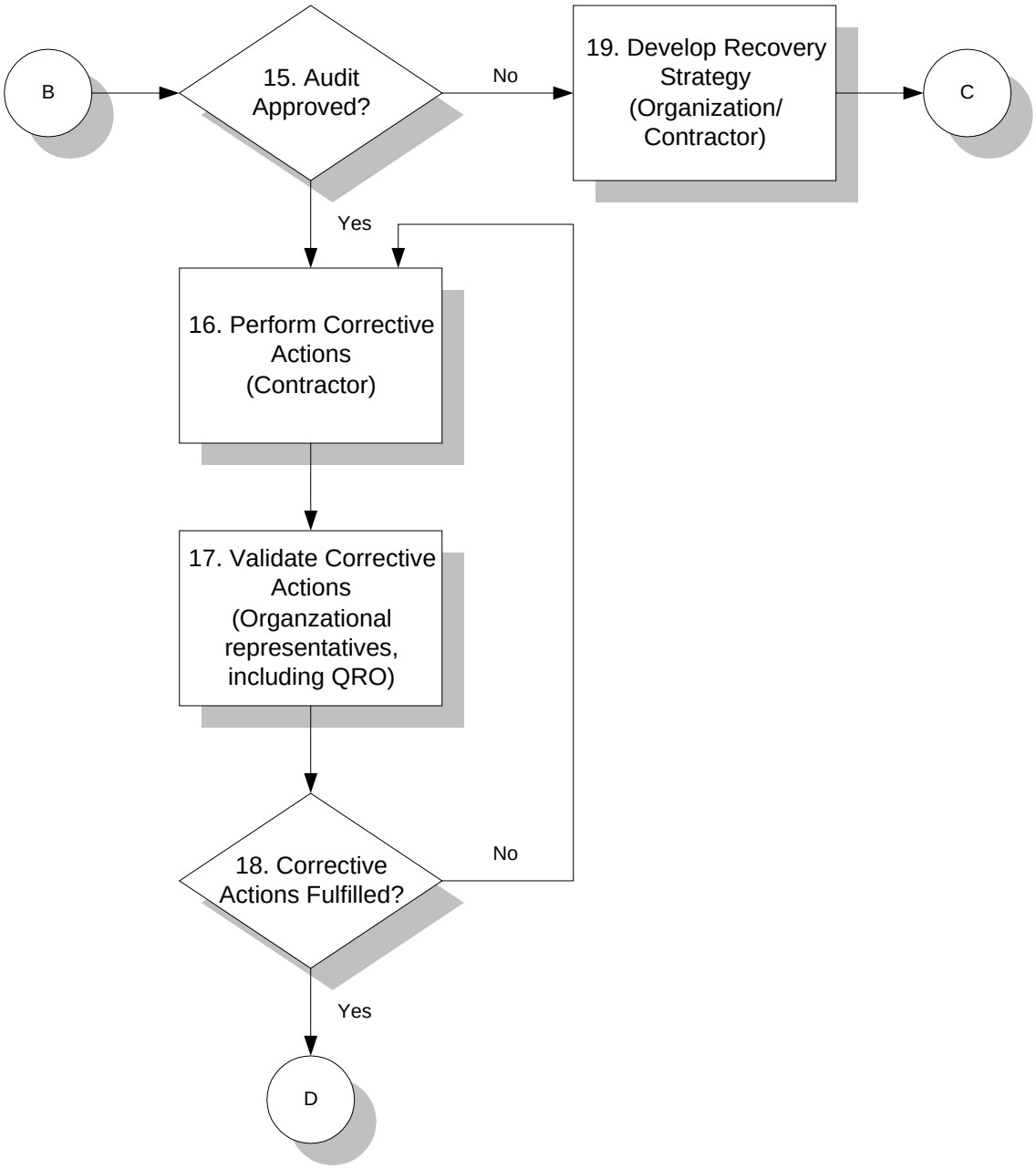

Figure 3.6.1.5-1. Functional Configuration Audits (Page 2 of 2)